Cirolana cranchi Leach, 1818 (Crustacea: Isopoda: Cirolanidae) redescribed, with notes on its distribution

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Cirolana cranchi is considered to be the type of the genus *Cirolana* Leach (by monotypy, Bruce, 1981) and as *Cirolana* is the type genus for the family Cirolanidae (Harger, 1880; Hansen, 1890), the species is of some significance. It comes therefore as some surprise to find that *C. cranchi* has not been effectively described since the work of Hansen (1890). The species has frequently been considered to be indistinguishable from *Cirolana parva* Hansen 1890 (Stebbing, 1917; Nordenstam, 1946; Monod, 1976), and though these authors have discussed at some length the similarities of the two species, none resorted to redescription.

Hale (1925) described a variety of *Cirolana cranchi* from South Australia. Examination of that species suggested that not only was Hale's variety quite distinct from *C. cranchi,* but that several closely similar species exist in the seas around Australia. It was therefore necessary to examine the holotype and specimens of *Cirolana cranchi* from England in order to be certain that none of the Australian species is *C. cranchi.*

To prevent any further confusion of *Cirolana cranchi* with *C. parva* and similar related species, a new description is given here with full figures, from specimens in the British Museum (Natural History) collections. The holotype, initially stored in the British Museum's dry collections (Ellis, 1981) is in extremely poor condition, lacking most appendages, setae and spines, and is in two pieces. The holotype, taken from Cornwall was closely compared to Norman's (1904) specimen to assure conspecificity, and the description and drawings are taken from the latter.

Cirolana cranchi Leach
(Figs 1–3)

Cirolana cranchii Leach, 1818 : 347; Gosse, 1855 : 134, Fig. 230; Hesse, 1866 : 257; Bate & Westwood, 1867 : 296, Fig. 5; Delages, 1881 : 156; Chevreux 1884 : 519; Koehler, 1886 : 25, 61; Bonnier, 1887 : 134; Heape, 1888 : 176; Robertson, 1888 : 76; Hansen, 1890 : 341, Pl. 3, figs 3–3i; 1905 : 350, Pl. 33. fig 3a; Stebbing, 1893 : 343; 1906 : 275; Norman, 1904 : 438; 1907 : 362; Norman & Scott, 1906 : 40, Pl. 4; Monod, 1923 : 14; 1930 : 137, 145, Figs 2, 5B; 1976 : 151; Larwood, 1940 : 33; Barrett & Yonge, 1958 : 99, Fig. 59; Crothers, 1966 : 58; Naylor, 1972 : 28, Fig. 9A–C; Ryland & Nelson-Smith, 1975 : 252; Kussakin, 1979 : 191, Figs 71, 72; Bruce, 1981 : 949.

Nelocira swainsonii Leach, 1818 : 347; Desmarest, 1825 : 302, Pl. 48, fig. 2.

Eurydice swainsonii: Milne-Edwards, 1840 : 236.

Conilera grampoides Gourrett, 1891 : 11, Pl. 1, fig. 7, Pl. 3, figs 4–11.

Cirolana cranchi: Marine Biological Association, 1931 : 183; 1957 : 195; Ellis, 1981 : 123.

Cirolana borealis: Clarke, 1971 : 103 (Non *Natatolana borealis* (Lilljeborg)).

Part *Cirolana cranchii,* Nordenstam, 1946 : 3, Figs 1–5. [More than one species is involved in Nordenstam's description.]

Non *Cirolana cranchii,* Barnard, 1920 : 346; 1940 : 392, 49, 499, Fig. 66; Kensley, 1978 : 65, Fig. 27B, C.[= *Cirolana vicina* Barnard, 1914].

TYPE. The holotype is held by the British Museum (Natural History).

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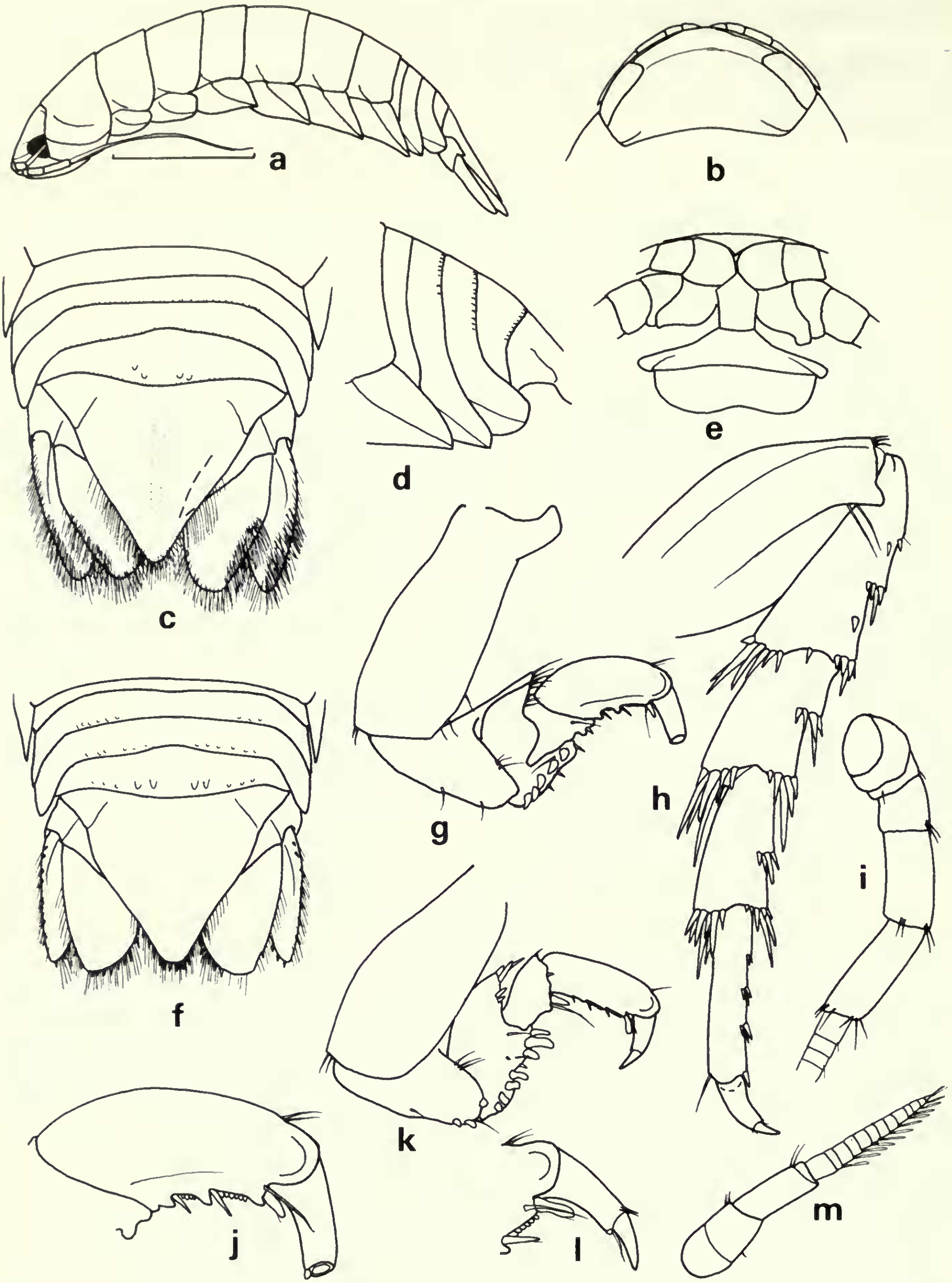

Fig. 1 *Cirolana cranchi:* (a)–(e), ♂ 17·0 mm, Polperro; (f) ♀ 13·3 mm, Polperro; remainder, ♂ 14·0 mm. Plymouth. (a) lateral view; (b) cephalon, dorsal view; (c) pleon and pleotelson, dorsal view; (d) pleon, lateral view; (e) clypeal region; (f) pleon and pleotelson; (g) pereopod 1; (h) pereopod 7; (i) antennal peduncle; (j) pereopod 1, propodus; (k) pereopod 2; (l) pereopod 2, dactylus; (m) antennule. Scale line represents 4·5 mm.

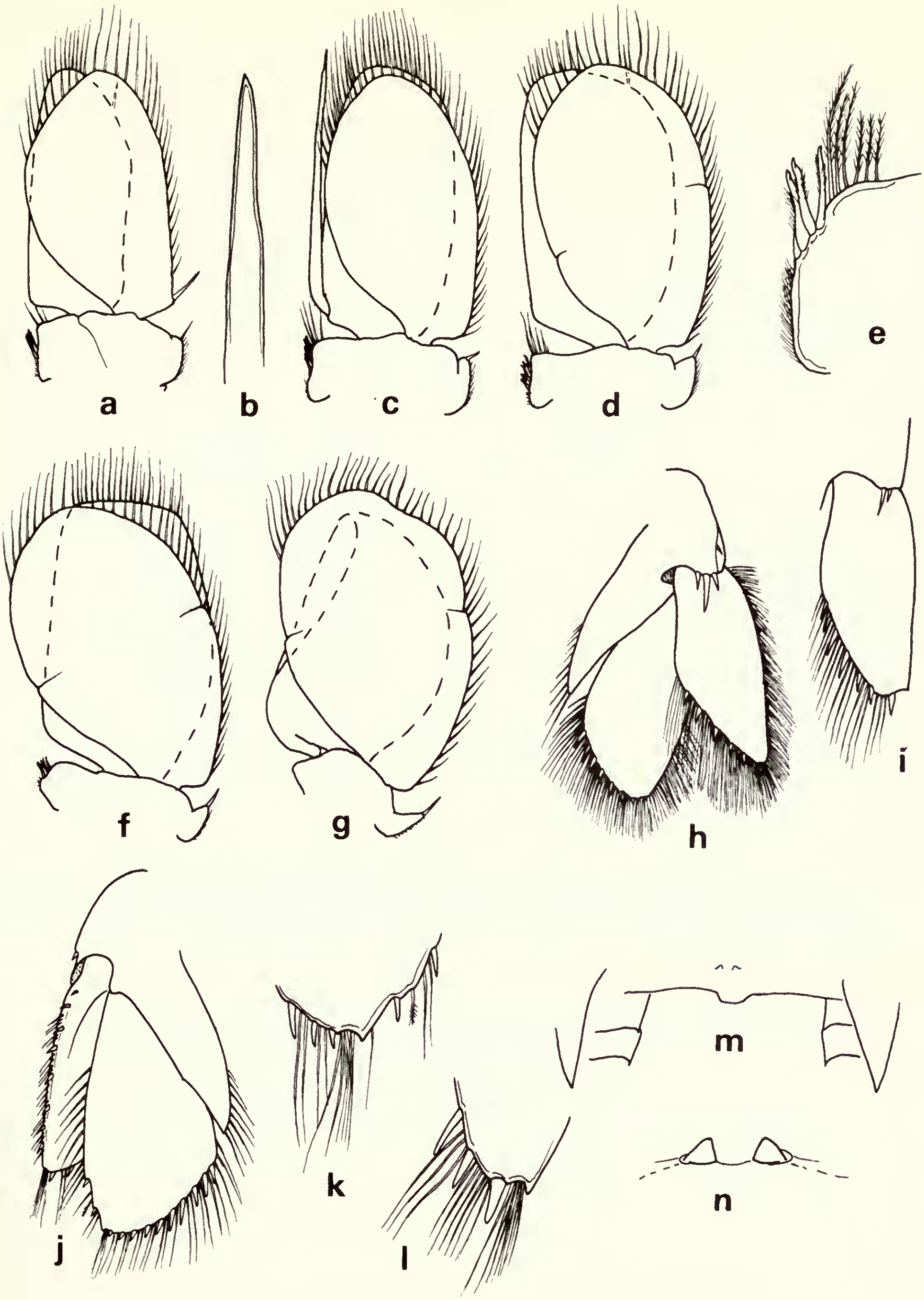

Fig. 2 *Cirolana cranchi:* all figs ♂ 14·0 mm except (i)–(l) ♀ 13·3 mm. (a) pleopod 1; (b) appendix masculina, apex; (c) pleopod 2; (d) pleopod 3; (e) pleopod 2, medial margin of peduncle; (f) pleopod 4; (g) pleopod 5; (h) uropod, ventral view; (i) uropodal exopod, ventral view; (j) uropod, dorsal view; (k) uropodal endopod, apex; (l) uropodal exopod, apex; (m) sternite 7; (n) penes.

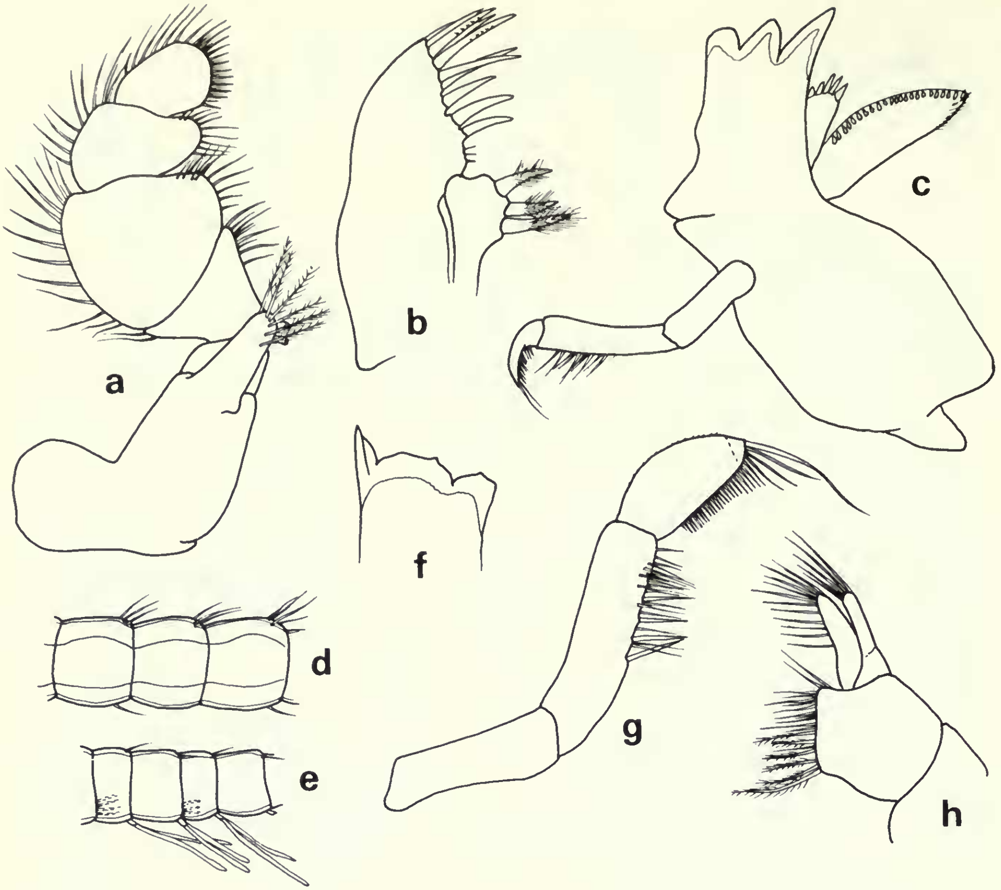

Fig. 3 *Cirolana cranchi:* all figs from ♂ 14·0 mm. (a) maxilliped; (b) maxillule; (c) right mandible; (d) antenna, flagellar articles 9–11; (e) antennule, flagellar articles 4–7; (f) left mandible, incisor; (g) mandibular palp; (h) maxilla.

TYPE LOCALITY. Leach (1818) gives 'Grande Bretagne' as the source of his specimens. Ellis (1981) records the locality as Falmouth, Cornwall.

MATERIAL. 2♂ (17·0, 13·3 mm), Polperro, Cornwall. Coll. A. M. Norman. BM(NH) Reg 1911. 11. 8 : 7840-49. 2♂(14·0, 9·5 mm) ♀ (12·6 mm), Plymouth, Devon. Coll. A. M. Norman. BM(NH) Reg 1911. 11. 8 : 7828–30. ♂ (17·2 mm), 2 ♀ (13·0, 13·5 mm), Torquay, Devon. Coll. A. M. Norman. BM(NH) Reg 1911. 11. 8: 7831–33. These specimens form part of those reported on by Norman (1904).

DESCRIPTION OF MALE. Body about 2·75–3 times longer than wide. Cephalon without rostral process, interocular carina on anterior margin, dorsal interocular furrow extending from the dorsal medial margin of each eye; posterior margin of cephalon with groove on each side indicating presence of maxillipedal somite. Pereonite 1 longest, with 2 horizontal furrows on each side; pereonites 2–7 approximately subequal in length; coxal plates each with distinct carina, posterior margins of coxae 5–7 straight, projecting beyond posterior margin of segment. Pleonite 1 entirely concealed by pereonite 7; pleonite 3 with posterolateral margins moderately produced, those of pleonite 4 rounded; dorsal surfaces of pleonites with posterior margins minutely crenulate, pleonite 5 with additional small tubercles. Pleotelson slightly more than 0·66 as long as greatest width, lateral margins sinuate, converging to narrowly rounded apex; posterior margins densely setose, with about 21 spines; dorsal surface flat except for two oblique anterolateral ridges.

Antennule peduncle triarticulate, articles 1 and 2 appearing fused, although suture evident; peduncular article 3 equal in length to combined lengths of articles 1 and 2; flagellum extends to posterior margin of eye. Antenna with peduncular articles 1 and 2 short, peduncular article 3 about half as long as 4, which in turn is half as long as 5; flagellum composed of about 38 articles, extends to pereonite 4.

Frontal lamina pentagonal, apex not overlapped by rostral process, lateral margins slightly concave, diverging slightly, anterior margins straight; about 0·5 times as long as greatest width. Clypeus about 5·75 times wider than long. Mandibles with asymetrical incisors, that of right mandible with 3 distinctly formed subequal cusps, that of left mandible with posterior cusp prominent, central cusp broad and shallow; molar process with about 25 teeth, inferior distal margin setose, lacina mobilis with about 7 spines; mandibular palp with terminal article curved ventrolaterally, lateral margins with numerous stiff setae. Maxillule with about 10 stout spines on gnathal surface of exopod, 3 robust plumose setae on proximal half of medial margin. Maxilliped with continuous marginal setae on palp articles 3–5, marginal setae on distal margins only of palp article 2; endite with 3 terminal and 3 lateral plumose setae, and with 2 coupling hooks.

Pereopod 1 with slender spines at posterior distal angle of basis; ischium with 2 setae on posterior margin and 3 setae at anterior distal angle; merus with about 6 setae at anterior distal angle, posterior margin with 3 acute spines and 5 tubercular submarginal spines; carpus with a single spine on posterior margin, set within a conspicuous indentation; propodus with 2 acute spines on palm, each spine set distally to tooth like projection, third robust spine opposes dactylus; margin of propodus minutely denticulate between spines. Pereopods 2 and 3 similar, pereopod 2 with 3 acute spines at anterior distal angle of ischium, 2 blunt spines at posterior distal angle, and third spine on the distal lateral margin; merus with 5 spines at anterior distal angle, posterior margin bisinuate, with 8 stout spines; carpus with a single stout spine and single seta on posterior distal angle, spine present on lateral distal margin; propodus with 3 spines on palm, fourth spine opposing the dactylus; dactylus with weakly developed but distinct secondary unguis, as in all pereopods. Pereopods 5–7 similar, pereopod 4 intermediate in form between anterior (1–3) and posterior (5–7) pereopods. Pereopod 7 with about 2 setae and anterior distal angles of propodus, otherwise without setae; distal angles of ischium, merus and carpus each with a group of spines; posterior margin of ischium and produs with further 3 groups of 1–4 spines; posterior margins of merus and carpus with further group of spines; propodus has spine opposing dactylus.

Penes set together on posterior of sternite 7, separated from each other by about 0·05 the width of the sternite; penes are not robust, but rather lamellar flaps of cuticle which originate posteriorly, and project anteriorly, lying against sternite.

Pleopods 3–5 with exopods with partial suture. Peduncles of pleopods 1–5 becoming progressively shorter towards posterior, peduncle of pleopod 1 twice as wide as long, peduncle of pleopod 4 3·5 times as wide as long; lateral distal angles each with a single spine, medial margin 3–5 coupling hooks on pleopods 1–4, pleopod 5 without coupling hooks. Pleopod 1 with rami subequal in length, endopod with margins parallel, exopod with spine at proximal lateral angle. Pleopod 2 with endopod fractionally longer than exopod; appendix masculina arises basally, extends beyond endopod by 0·1 of its length, narrows smoothly to an acute apex.

Uropods extend distinctly beyond apex of pleotelson. Exopod slightly shorter than endopod, lateral margin smoothly convex, with continuous marginal setae and about 9 spines, distal half of lateral margin with dense mass of setae extending on to dorsal surface; medial margin with distinct angle half way along its length, distal half with 6 spines and dense mass of marginal setae; apex not bifid. Endopod with lateral margin angled at about 0.33 of the way along its length, proximal 0·66 densely setose, setae extending onto dorsal surface; medial margin convex with dense marginal setae and about 8 spines; apex not bifid.

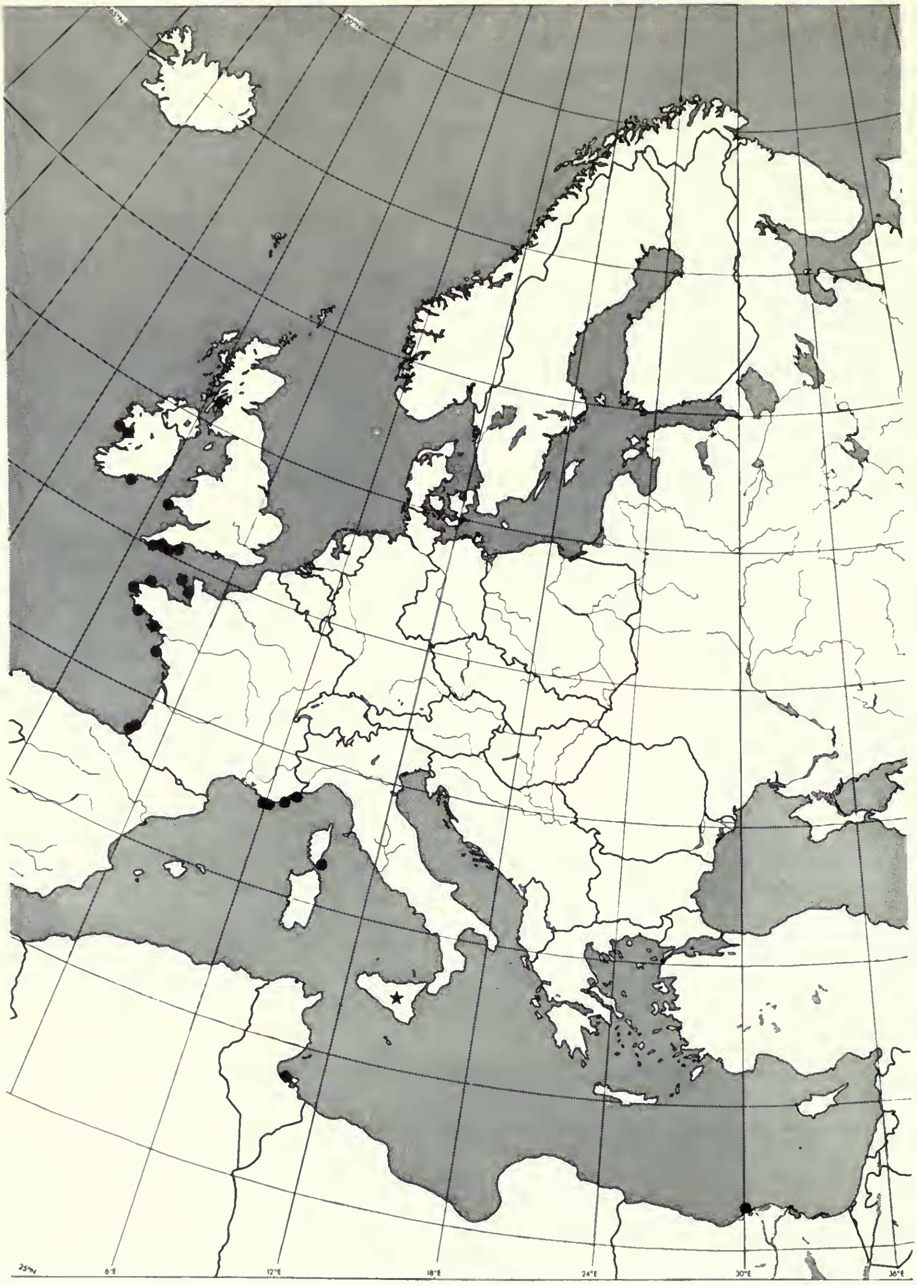

Fig. 4 Map showing the distribution of *C. cranchi*. *Type locality of *Nelocira swainsonii* Leach, 1818 given as Sicily.

FEMALE. The only differences from the male are in the shape of the pleotelson which is wider, in the shape of the uropods which are not angled, and the lack of the dense setae on the pleotelson and uropods.

DEVELOPMENT. Young males are similar to females, and the characteristic shape and setation of the uropods of large males is acquired gradually. One female has oostegites, and measured 13·3 mm.

VARIATION. From the specimens examined, it would appear that the minute crenulations on the pleonites are not visible in large males. The presence and distribution of tubercles on the dorsal surface of the pleonites is erratic.

SIZE. Hansen (1905) records the largest specimen as a female of 18.0 mm. Museum material had adult males from 9·0–19·1 mm, females ranged from 9·6–19·2 mm.

COLOUR. In alcohol, all a pale tan. Barrett and Yonge (1958) describe the colour as 'very pale grey, minutely dotted on first three segments; rear edge of first seven segments marked by transverse line'.

REMARKS. The shape and setation of the pleotelson and uropods are unique, and immediately separate *Cirolana cranchi* from all other species of *Cirolana.* Other characters useful in separation include the shape of the frontal lamina, the shape of the posterolateral margins of the pleonites, the length and shape of appendix masculina, the shape of the endopod of pleopod 1, and the form of the penes.

Cirolana cranchi can be separated from *C. parva* by the lack of a rostral point, by not having the frontal lamina overlapped by a rostral projection, and the very different shape, setation and spination of the pleotelson and uropods.

DISTRIBUTION. Reliably recorded only from the eastern North Atlantic and Mediterranean. These records are summarized here together with new records from the collections of the British Museum. Fig. 4 illustrates the present distribution of *Cirolana cranchi.*

Firth of Clyde: Cumbrae (Bate & Westwood, 1867); Fairland Point, Cumbrae (Robertson, 1888).
Galway Bay, Eire: Spiddal (Ryland and Nelson-Smith, 1975); near Galway (Naylor, 1972); North Sound (Clark, 1971, as *Cirolana borealis).*
Nymphe Bank: Ballycotton, County Cork, Eire (BM(NH) Collections).
St George's Channel: Dale, Pembroke (Crothers, 1966).
English Channel: Falmouth (BM(NH), holotype); Gwyllyn Vase, Falmouth (Stebbing, 1906); Polperro, Cornwall; Torquay (Norman, 1904); Plymouth, outside breakwater (Bate & Westwood, 1867); Batten, Mewstone Ledge, Tinside and Stoke Point, Plymouth (Marine Biological Association, 1957); Knapp Buoy, Plymouth (Heape, 1888); Torbay (BM(NH) collections); Anstis Cove, near Torquay (Stebbing, 1893); Jersey (Koehler, 1886); off St Sampson's Harbour, Guernsey (Norman, 1907); Roscoff (Delages, 1881).
Bay of Biscay: Minou, Brittany (Hesse, 1866); Concarneau (Bonnier, 1887); Grands-Carneaux and east of Belle-Isle, Croisic (Chevreux, 1884); Le Croisic; Belle Isle; Ile d'Yeu; Guethery, near Biarritz (Hansen, 1905); Capbreton (Norman, 1904).
Mediterranean: Toulon; Cannes; Porto Vecchio, Corsica; Gabes, Tunis (Hansen, 1905); Rade d'Hyeres (BM(NH) collections); Brusq, Var (Gourret, 1891, as *Conilera grampoides);* Villefranche (Hansen, 1890); Monaco (Monod, 1923); Sicily (Leach, 1818, as *Nelocira swainsonii*); Alexandria (Larwood, 1940).

Discussion

Leach (1818) recorded *Cirolana cranchi,* the second species of what was to become the family Cirolanidae. The species then received little attention up to the revision of the family by Hansen (1890). In that publication and a later one Hansen (1905) reviewed all previous records. Records published since Hansen's two publications have basically contributed little towards an increased knowledge of the species. Monod (1930) figured the pleopods, and Kussakin (1979) gave new figures for the antenna, pereopods 1 and 7 and the male second pleopod, his other figures being taken from Hansen (1890). From this it can be seen that although the figures given by Hansen (1890) are of a high standard, no modern description has been given.

As a consequence of the lack of detailed description *Cirolana cranchi* has become confused with *Cirolana parva.* The initiator of this confusion was Stebbing (1917) who considered *C. cranchi* and *C. parva* as likely to be synonymous. This opinion was later followed by Nordenstam (1946) who went to some length to demonstrate that the two species were one. Unfortunately, he chose to do this by illustrating pereopod characteristics, the one character likely to lead to the conclusion to which he came. Pereopods in the genus *Cirolana* (sens. str. Bruce, 1981) vary very little between species. Monod (1976) entered the argument in describing a *Cirolana* sp. from Togo, West Africa. In this paper Monod reviewed the arguments of previous authors, and discussed Hansen's (1890) diagnoses. Monod came to the conclusion that the West African species could be assigned neither to *cranchi* nor to *parva* and nor could they be said not to belong to those species. In effect, that *parva* and *cranchi* are not separable.

When reviewing this debate, the most surprising aspect is that the problem existed at all. Hansen's (1890) figures clearly separate the two species. The differences in frontal lamina shape, pleotelson and uropods, presence and absence of rostral process are all clearly shown. Hansen also states that in *parva* the uropod apices are bifid, and in *cranchi* entire. It also seems remarkable that no author encountering this problem has sought to redescribe the species involved as a solution. Comparison of the figures, description and remarks given here to those of Bruce & Bowman (1982) show that *Cirolana cranchi* and *Cirolana parva* are two readily separable species.

As there has been some confusion over the species included under the synonymies of *Cirolana cranchi,* the most important of these are now listed and discussed.

Cirolana swainsonii: Miers, 1881. Examination of Miers' specimens shows that they represent a species related to, but distinct from *cranchi* that has yet to be described.

Cirolana vicina Barnard, 1914. This species is very similar to *C. cranchi* and should be redescribed before final judgement on its status is passed. From Barnard's (1914) description it differs in having 'sub-bifid' uropod apices, and lacks the dense mass of setae on the uropods.

Cirolana cranchii var. *australiense* Hale, 1925. This species is in no way a race or variety of *C. cranchi.* It differs in the shape of the frontal lamina, pleotelson and posterolateral margin of pleonites 2–4, and has a distinct rostral process.

Cirolana cranchii: Nordenstam, 1946. Nordenstam's material came from Europe, South Africa and the Pacific, and consisted of *C. cranchi., C. vicina* and a species of unknown identity from the Pacific.

Cirolana australiense Naylor, 1961. This species is closest to the variety described by Hale (1925), but may be a distinct species. Naylor's specimens were from the Chatham Islands, New Zealand.

Cirolana sp.: Monod, 1976. Monod figures two '*Cirolana* sp', one from Togo, and one from the Congo. One of these is *Cirolana chaloti* Bouvier, 1901 (Bruce, in press), and the other species may well be new. Monod's (1931) record of *C. cranchi* may be of one of these species.

In conclusion, it should be emphasized that in identifying or describing species related to *C. parva* and *C. cranchi* particular care and attention should be given to details of the frontal lamina, the relative position and shape of the penes, the shape of the posterolateral margins of pleonites 2–4, the first and second pleopods of the male, and most importantly details of the pleotelson and uropods.

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